MILESTONE 2

TASK A

1. *Problem Introduction*

UGA's campus, although very beautiful, can be very confusing to newcomers. Incoming students, visitors and people taking tours, as well as new faculty members will need to be able to locate the various bus stops around campus to navigate the bus system. There are signs posted at each bus stop to indicate where to wait for a bus, however they may not be obvious to those who are not familiar with the campus. Some individuals might walk right past the signs without realizing. The UGA bus app has a 360° feature that provides a 3D map and virtual rendering of the bus stop and its near surroundings. The purpose of the feature is for the user to have a preview of the nearby environment, so that when looking at buildings and street signs, they will be better informed of their position. Unfortunately, the feature does not always work as designed, and some aspects are counterintuitive to a positive user experience.

The UI seems to work smoothly on Android devices, but on iOS devices, the user experience is comparatively poorer. The 360° feature, which is found when clicking on the "360°" signifier in the search bar under the 'stops' tab on the navigation bar, redirects the user to a website that opens on the device's native web browser. This affordance of clicking may not be intuitive to the user, as the properties of the "360°" signifier does not look like a button. The window size is not automatically adapted, and interferes with the affordance to zoom in/out on the map. At times, this can cause it to become unusable. Attempting to move the map may result in a glitch that sends the map to a random location. Aside from the iOS integration issues, some of the properties interfere with each other; such as the bus stop selection signifier being transparent, which can cause overlapping properties such as text. More so, the act of going in and out of the app to be able to find directions can prove to be a frustrating and confusing user experience because of the discontinuity in affordances. Users are not easily able to switch from this feature to other features on the UGA bus app. Additionally, users are not given the affordance to select their own starting point. Rather, the app automatically routes the destination from the user's current location. Some aspects of the feature itself that might contribute to the problem are the appearance and behavior of the website on mobile devices. We also see glaring issues such as unexpected behavior when resizing the map. Issues with properties of overlapping text seem to be present on both iOS and Android versions, which hinders readability. Yet another issue with the UI is the popups that appear after clicking bus stops or other signifiers, which then take up most of the screen and make it difficult to reaccess the map.

This problem is theme relevant as these design flaws hinder an individual's ability to navigate UGA's campus. This is particularly important for newcomers who are unfamiliar with the campus, and would greatly benefit from a 360° rendering. The UGA bus app facilitates individuals' educational experience, ranging from students trying to go to class to stakeholders visiting campus.

Seven Stages of Action

S1: Goal	The user's goal is to route themself from one bus stop to another.
S2: Plan	The user needs to determine the easiest and most efficient way to get from point A to point B across campus. When consulting their options, they narrow down a few - asking for directions, trying to read a map, or utilizing the UGA bus application.
S3: Specify	The user determines that one of the best ways to navigate campus would be to use the official UGA bus application, which comes with additional tools like the 360° view. The user believes this is the ideal choice because applications are developed with usability in mind, and the experience will be smoother than trying to decipher a map or asking a stranger.
S4: Perform	The user opens the UGA application, navigates to "UGA bus", goes to the "stops" tap and clicks "360°" and is taken to a Google Maps-like application. After selecting their stop, they try to use their fingers to move the map in order to see the surrounding area, and end up moving the page itself. They also can't select their starting destination. Additionally, when trying to tap on bus stops, they are bombarded with overlapping dialogue box windows that they become unable to be closed. The user has difficulty trying to work around this.
S5: Perceive	After wrestling with the application, the user has routed themself to their chosen destination. The user is mapped from their location to the desired location using a blue line. The bus stop signifier remains on screen while the step-by-step directions are displayed in the bottom left of the screen. As they wait for a bus at the stop, they can't help but be frustrated that the experience did not go more smoothly.
S6: Interpret	Even though the user was able to eventually direct themself using the app, the poor user experience made them question whether or not it was worth their time. Overall, they are frustrated with the ordeal and their day may even be irreparably ruined.
S7: Compare	The user's interpretation of what they perceived leads them to believe that they met their goal. However, they are unhappy with the way it was met. In the future, the user will prioritize one of the alternative methods that they had originally thought of.

As a group, we know this interaction is typical because when we attempted to use the application to navigate to a stop, all of us had issues with the user interface which we found frustrating. It would not be uncommon for a new student who is less familiar with the campus and the application as a whole to run into difficulty trying to get it to work.

2. *Potential Users*

The potential user population that is affected by our problem of study includes any individual who may be unfamiliar with the UGA campus. These individuals may be new students, faculty, staff, and any touring visitors. They are also the most affected by the problems identified in the UGA bus app , as they are more reliant on it than other campus goers. Related tasks that they perform on the app's 360° feature consist of routing directions from point A to point B, viewing step-by-step directions, and zooming in or out or moving around the map. Users would benefit from a solution to the problems mentioned as it would result in a less stressful user experience by facilitating a smoother map viewing and direction obtaining process.

TASK B

1. *Existing Solutions*

One potential solution that users could use as an alternative to the bus app would be to simply use a third party application, such as Google Maps which is the most popular navigation solution (Statista). The process is somewhat more involved and not as streamlined as the UGA bus app strives to be, but the overall experience proves much less frustrating without having to deal with obnoxious pop-up dialogue boxes that take up a majority of the user's screen, or having to switch between apps as most third party navigation apps host all features within the app, having a user-centric design is critical for the user experience to be successful (Samrgandi). A con of most third party apps however is that they are not specific to the area in which they are being deployed. For our specific scenario, revolving UGA's campus, third party navigation apps are not designed specifically for campus goers. They do not include vital information, such as all of the bus routes on an easily accessible page. Additional solution options, as we mentioned earlier in the "Seven Stages of Action" section, would be to either ask for directions from a stranger or perform good old-fashioned navigation and use a paper map. Both of these alternatives come with their own share of issues, as talking to strangers may be a potentially dangerous task, and navigating a map can be difficult if you have no bearings of your surroundings and are inept at using traditional maps.

2. *Potential Guidelines & Solutions*

General guidelines for mobile application development follows in designing UGA's bus application where it is consistent, clear, and easy-to-understand. This is helpful as a cluttered, and glitchy, application view minimizes readability (Nepper). The user should have an intuitive understanding of how to use said application with well-labeled icons and buttons that provide an easy to use navigation and selection of pages. These should be intuitive to the user, to maximize a user friendly experience (Nepper). Bus routing should be handled in-app in order to reduce reliance on out-of-app experiences which may result in cluttering of the application experience. This is particularly important as seamless integration enhances usability (Nepper).

TASK C

1. *Solution Proposal*

We want to integrate the in-app Google Maps as a more functional and well-rounded utility that replaces the need for UGA's personally designed virtual campus mapping due to the fact that Google maps gives a more stream-lined and friendly user experience for navigation around campus. In fact, the other features within the bus app redirects the user directly to the google maps app. The replacement would benefit the student body, faculty, and staff greatly due to the more accurate data points of bus routes and bus locations which would overall improve the campus' flow of traffic during heavy hours of throughput. Throughput, in our sense, is the rate of cars and buses going in and out of UGA's campus and inner streets. As we want to better integrate this solution, we want to make this transition over to Google Maps seamless across all platforms, but more specifically, we want the difference between Android users and iOS users to be as minimal as possible which gives a more continuous look to the UGA mobile application. This use of Google Maps will hopefully give a more intuitive look and feel to the application given that the map placement and rotation should be easier to use in comparison to UGA's virtual map which has a clunky UI with bad overlaying text and modals.

An alternative proposal would be to rework UGA's virtual map such that orientation, overlay, and routing are smoother. This process would take a deeper look into the developer's back end of the application to solve the cluttering of various properties such as overlapping text elements, as well as rectangular window formatting issues. The affordance of zooming in and out of the map has proved to be an issue that doesn't scale well within the mobile application, and clicking menu options is clunky and overpowers the map when being selected. Improvement on signifiers such as the 360° button on UGA's bus app could be displayed more robustly, so that users have more understanding that clicking 360° is an actual function instead of an icon being off to the side. This change in UI can help with clarity when new users are introduced to the system because the layout highlights important features that are underutilized with UGA's bus app's current design.

Integrating Google Maps into UGA's bus app is a better solution because it gives a more seamless transaction of not opening a third-party app that leaves UGA's domain. When a user leaves the application, it increases the amount of traveling back and forth to find routes and destinations that leaves the user feeling more frustrated when switching between apps. In the solution of fixing UGA's bus app internally, it proves to be a better functioning app that has a cleaner and more intuitive overlay. All properties such as window sizings and text features should be more scalable to the user's screen and better perform affordances like zooming in/out, not within the modal, but of the map itself. Both prove to be valid solutions that clear up the uses of the bus application, and it outshines the current UGA bus app due to the faulty nature of some properties like buttons, windows, and the map interface.

2. *Measuring Success*

Since the benefits of a solution to the problem include a better user experience, as well as smoother processes of map traversal and getting directions, it will be slightly difficult to quantify a success measure as these are more qualitative traits. However, some criteria that should be used to judge if the design is a success would include direct user feedback on their stress levels and the ease of app usage. Moreso, a general criteria of success would be if the app was beneficial to the individual with regards to assisting them in their navigation of the UGA bus routes. In order to establish whether or not there is actual improvement based on the design, these measurements must be conducted with the current UGA bus app as well as the improved prototype. Concisely, the individuals partaking in success measurement would provide feedback in 2 categories: overall user experience, with regards to stress and satisfaction levels, and ease of usage. We have not concisely defined our evaluation quite yet, however we would like to rely on some previously defined methods such as heuristic evaluation, perspective based UI inspection, and pluralistic walk-throughs. These methods help us provide an accurate success measure for usability factors that are important to our problem of study.

Method	***Development***	***Usability***
Heuristic Evaluation	Requirements to implementation, conceptual design, detailed design, implementation	Learnability, Efficiency, Consistency, Errors, Flexibility
Perspective Based U.I. inspection	Generate ideas, find solutions conceptual design, detailed design, implementation	Learnability, Efficiency, Consistency, Errors
Cognitive Walk through	Realistic tasks, core features, conceptual design, detailed design, implementation	Learnability
Pluralistic walkthroug h	Early design, purpose and goals, conceptual design, detailed design implementation	Learnability, Efficiency, Consistency, Errors, Flexibility
Formal Usability Inspection	Working products, planning Requirements Conceptual designs, detailed designs Implementation	Learnability, Efficiency, Consistency, Errors, Flexibility

(Figure: Samrgandi)

TASK D

Summary Video

https://www.youtube.com/watch?v=tUjDGa1xx9M&ab_channel=ErikDebawse

CITATIONS

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